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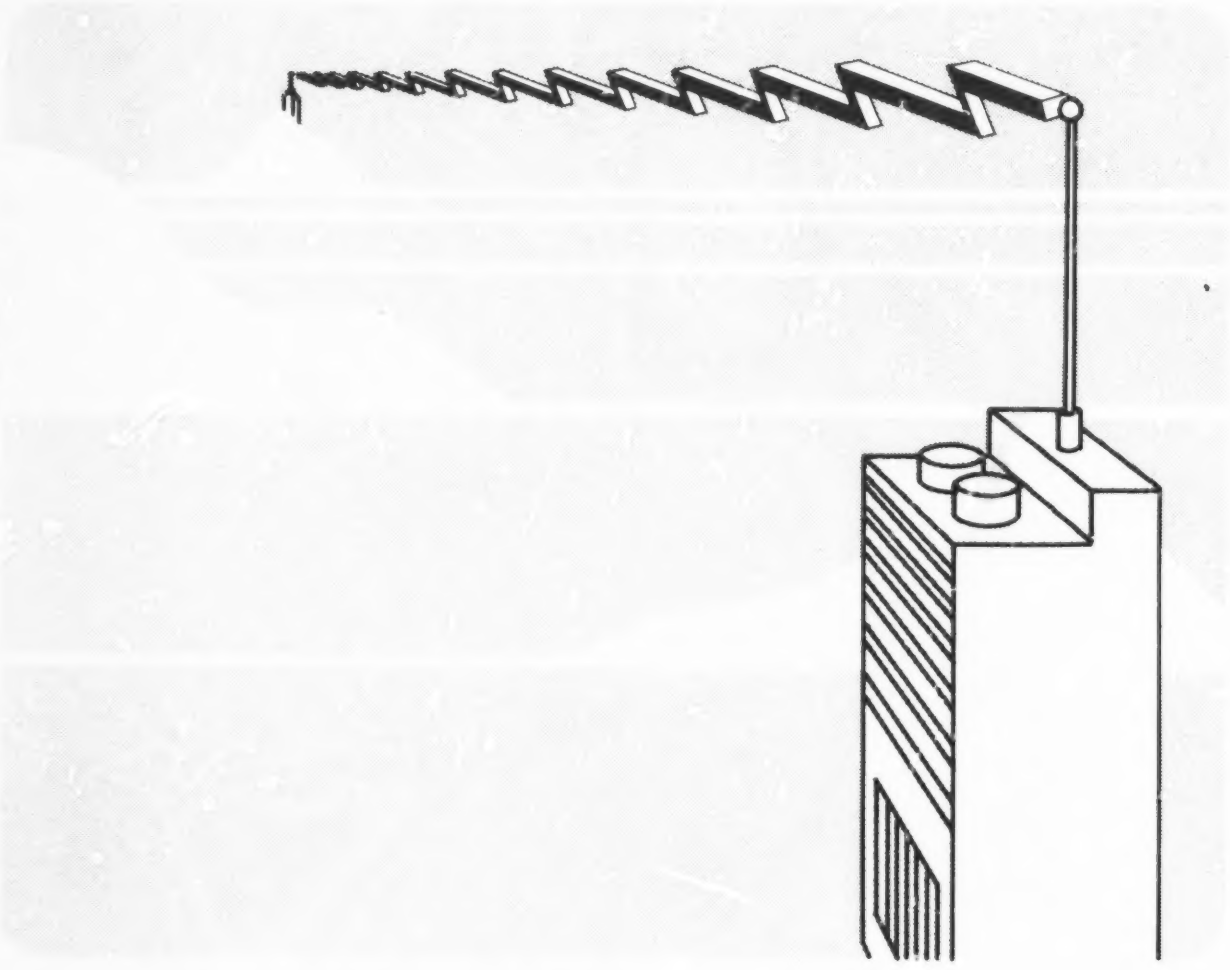
Maintenance Manual

Remote Radio Pickup Units



COMPLETED

MAINTENANCE MANUAL

REMOTE RADIO PICKUP UNITS

Federal Emergency
Management Agency

Maintenance Manual
Remote Radio Pickup Units

Introduction

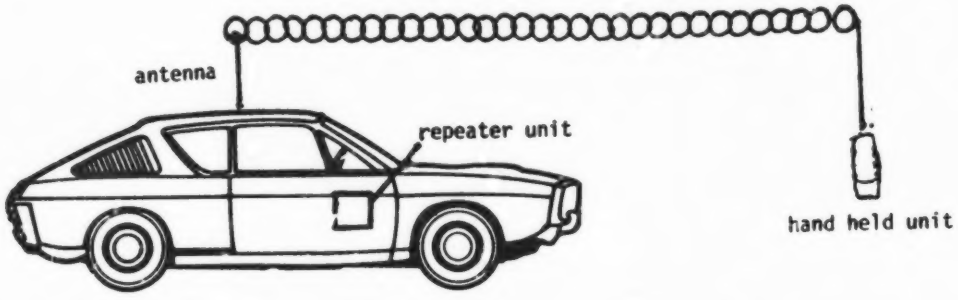
The purpose of this manual is to guide you on how to maintain the equipment that makes up a remote radio pickup unit. The information in this manual is only a **supplement** to the recommended maintenance information supplied in the service manuals provided by the manufacturers of the equipment. **Always follow the maintenance procedures provided in the manufacturer's manuals.** This manual will help you understand why maintenance is necessary. This manual will also be helpful if the manufacturer's maintenance manuals are not immediately available.

Description of Remote Radio Pickup Units

Rapid technical advances have pushed mobile communications equipment into smaller and smaller packages, with the ultimate being a personal transmitter/receiver which will fit conveniently carried. This continual reduction in size has been accompanied, however, by a significant reduction in communication range because of reduced antenna efficiency and available battery power. The reduction in antenna efficiency is applied to both the transmitter and receiver, whereas the reduction in battery power must be applied to the transmitter only.

A remote radio pick up unit, illustrated in Figure 1, was designed to take advantage of the small size, without sacrificing transmission or reception quality or distance. This is accomplished by using the more powerful car or truck mobile radio as a repeater station as well as a battery charger for the remote unit.

Figure 1



From a maintenance perspective, the most important components of a remote radio pickup unit are the antenna and the batteries. Remote radio pickup units use small antennas. Small antennas in turn limit the transmission and reception range of the radio. There are a number of

batteries available for use with remote radio pickup units such as carbon-zinc, alkaline, mercury cell and nickel-cadmium. We will examine the rechargeable nickel-cadmium battery in more detail.

The nickel-cadmium battery is highly efficient, capable of being recharged hundreds or thousands of times under the right circumstances. Two common types of nickel-cadmium batteries are called vented and nonvented. The nonvented battery is permanently sealed and resembles an ordinary dry cell. The vented battery looks like a lead-acid cell; it has a removable plug to permit gas venting during recharging. Normally, the terminal votage of a nickel-cadmium battery runs between 1.25 and 1.30 volts. A voltage of 1.1 volts means that the battery needs recharging. A nickel-cadmium battery can be easily recharged for long periods of time. However, overcharging can destroy the battery. Examine manufacturer's information on recharge time and frequency; watch your use of the remote radio pickup unit and how it affects your batteries' ability to power the unit.

Preventive Maintenance

To ensure that your remote radio pickup units work in an emergency, you should develop a program where you **regularly check the units to spot small troubles before they become big problems.** A program of coordinated monthly,semiannual and annual maintenance checks prevent serious problems from suddenly happening.

Routinely clean all the units. Check for frayed connections and loose bolts and parts; inspect the antennas. These checks are not normally mentioned in manufacturer's manuals, but can lead to more serious problems.

Equipment and Spare Parts

Only ordinary mechanical and electrical tools are needed to perform most maintenance on this equipment. You may also need a multimeter to correct some specific problems.

Maintain a list of spare parts. The solid-state equipment found in these units has few user serviceable parts. The following table gives you a list of user servicable spare parts.

Spare Parts: Remote Radio Pickup Units

Names of parts	Quantity
complete replacement units	4
recharging unit	1
antennas	8
nickel-cadmium batteries	12

Safety

Follow safety precautions outlined in maintenance manuals supplied by the manufacturer. Remember, only a qualified electronics technician should attempt to repair any serious electrical problems. The low levels of power generated by these units does not pose any **special** safety hazards. Nevertheless, there may be safety suggestions in the manufacturer's manuals related, for instance, to the battery and its limits. Read and adhere to these suggestions.

Monthly Maintenance Checks

1) Clean exterior surfaces of radio to remove moisture and loose dirt with a clean, soft cloth.

6-Month Maintenance Checks

1) Clean terminals of portable portion of radio to remove moisture, rust, and corrosion.

2) Examine antenna system for breaks, cracks, chafing or excessive strain.

3) Check controls for smooth mechanical operation. Check to see that the knobs are tight.

4) Examine battery charger for missing parts, contacts, etc.

12-Month Maintenance Checks

1) Clean battery contacts inside unit to remove any corrosion.

2) Measure charge generated by battery charger to make sure that it is within manufacturer's specifications.

Corrective Maintenance: Troubleshooting

Some equipment malfunctions may be discovered during inspection or use of your remote radio pickup units. Perform the tests on the following tables to locate, and possibly correct, the problem.

PLEASE NOTE: This manual does not attempt to list all possible malfunctions that could occur nor can we suggest all possible remedies. Consult the manufacturer's manuals if a malfunction is not listed or it is not corrected by a prescribed procedure.

Corrective Maintenance: Remote Radio Pickup Units (Part 1 of 2)

Malfunction	Possible Cause	Recommendation
1. Unit does not operate; power light does not glow	■ low battery	■ charge or replace battery
	■ defective on-off switch	■ if voltage is with switch in either position, replace switch
	■ pilot light	■ replace old bulb
2. Unit does not operate; power light glows	■ short within portable unit power circuit	■ if no voltage, replace unit with spare
	■ repeater station defective	■ locate and repair problem
	■ antenna system	■ check antenna on portable unit & repeater station
3. Unit transmits, but does not receive	■ squelch set too tight	■ adjust squelch control
	■ defective relay	■ Short antenna & receiver input contacts. If operation restored, burnish & adjust relay contacts.
4. Unit receives but does not transmit	■ out of range	■ move closer to repeater station vehicle
	■ low battery	■ recharge or replace battery

Corrective Maintenance: Remote Radio Pickup Units (Part 2 of 2)

Malfunction	Possible Cause	Recommendation
5. Operator controls do not work properly	■ defective radio set or loose knobs	■ a. check knobs for tightness; tighten or replace as necessary. 1) tighten the set-screws.
6. Radio set does not tune to desired frequency	■ defective radio set	■ remove & replace radio set
7. Excessive hum heard while receiving	■ radio set defective	■ remove & replace radio set if necessary
8. Squelch does operate properly	■ squelch control improperly adjusted. Defective radio set.	■ adjust squelch. Remove & replace radio set if necessary.
9. Radio set works on some frequencies but not on others	■ radio set defective	■ remove & replace radio set

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